

***Brykendrickia catenata* gen. & sp. nov. from India**

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ABSTRACT—A new hyphomycete genus and species, *Brykendrickia catenata*, collected on decaying culms of bamboo species from Indian forests, is described and illustrated. *Brykendrickia catenata* is the type species for a new monotypic genus possessing sporodochial conidiomata. Conidiogenous cells are polyblastic, rarely monoblastic, cylindrical, and hyaline to subhyaline. Conidia are loosely cheiroid, blastocatenate, and produce branches of doliiform to oblong, botuliform, globose or subglobose, sub-hyaline to light grey cells.

KEY WORDS—asexual fungi, systematics, taxonomy

Introduction

India is one of the richest reservoirs of biodiversity in Asia. During ongoing surveys on wood inhabiting fungi, many new ascomycetes, basidiomycetes, and asexual fungi (especially hyphomycetes) have recently

been described (Adamčík & al. 2015; Buyck & al. 2017; Prasher & Verma 2014, 2015a,b,c; Prasher 2015; Sushma & al. 2019; Verma & al. 2019). Here we describe and illustrate a conidial fungus collected on dead and fallen bamboo culms from Mandi district, Himachal Pradesh. The fungus could not be morphologically accommodated in any of the published hyphomycete genera (Ellis 1971, 1976; Subramanian 1971; Matsushima 1975, 1983, 1985, 1989, 1993, 1995; Carmichael & al. 1980; Castañeda-Ruiz 1985, 1986a,b, 1987, 1988; Castañeda-Ruiz & Kendrick 1990a,b, 1991; Seifert & al. 2011; Punithalingam & Spooner 2011). Therefore, a new genus, *Brykendrickia*, is proposed.

Materials & methods

Decaying culms of *Bambusa* sp. were collected, placed in paper bags, and taken to the laboratory. The specimen was mounted in 0.01% cotton blue in lactophenol, and 2% congo red in 50% ammonia (Kirk & al. 2008) and examined under a Matrix VL-Z60 stereo trinocular microscope and VRS-2f compound microscope. For scanning electroscopy, material was vacuum-dried in an oven for 24 hours, mounted and sputtered with gold for 60 seconds, and photographed in a JEOL JSM-6100 scanning electron microscope. The specimens were deposited in the herbarium of the Department of Botany, Panjab University, Chandigarh, India (PAN). Repeated attempts to culture the fungus failed on PDA (2% agar broth, potato dextrose agar), oatmeal agar, malt extract agar (MEA), and a solidified glucose peptone medium (glucose 10 g/l, peptone 2 g/l, KH_2PO_4 1 g/l, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ 0.5g/l. and agar 20 g/l in 1000 ml H_2O with chips of host).

Taxonomy

Brykendrickia Rajn.K. Verma, Prasher, Rajeshk., Sushma, A.K. Gautam & R.F.

Castañeda,

MB 835296

Differs from *Brachyconidiellopsis* and *Brachyconidiella* by its rudimentary, pustulate conidiomata and its undifferentiated conidiophores.

TYPE SPECIES—*Brykendrickia catenata* Rajn.K. Verma & al.

ETYMOLOGY—Latin, *Brykendrickia*, in honor of Prof. Bryce Kendrick, who has contributed immensely to hyphomycete taxonomy.

Conidial fungi, hyphomycetes. CONIDIOMATA sporodochial, rudimentary, pustulate. Mycelium mostly superficial, composed of septate, rarely branched, hyaline to subhyaline (pale greyish) hyphae forming mats. CONIDIOPHORES undifferentiated. CONIDIOGENOUS CELLS polyblastic, rarely monoblastic, terminal, discrete or integrated, sympodially elongated, cylindrical or clavate, hyaline to subhyaline. CONIDIAL SECESSION schizolytic. CONIDIA loosely

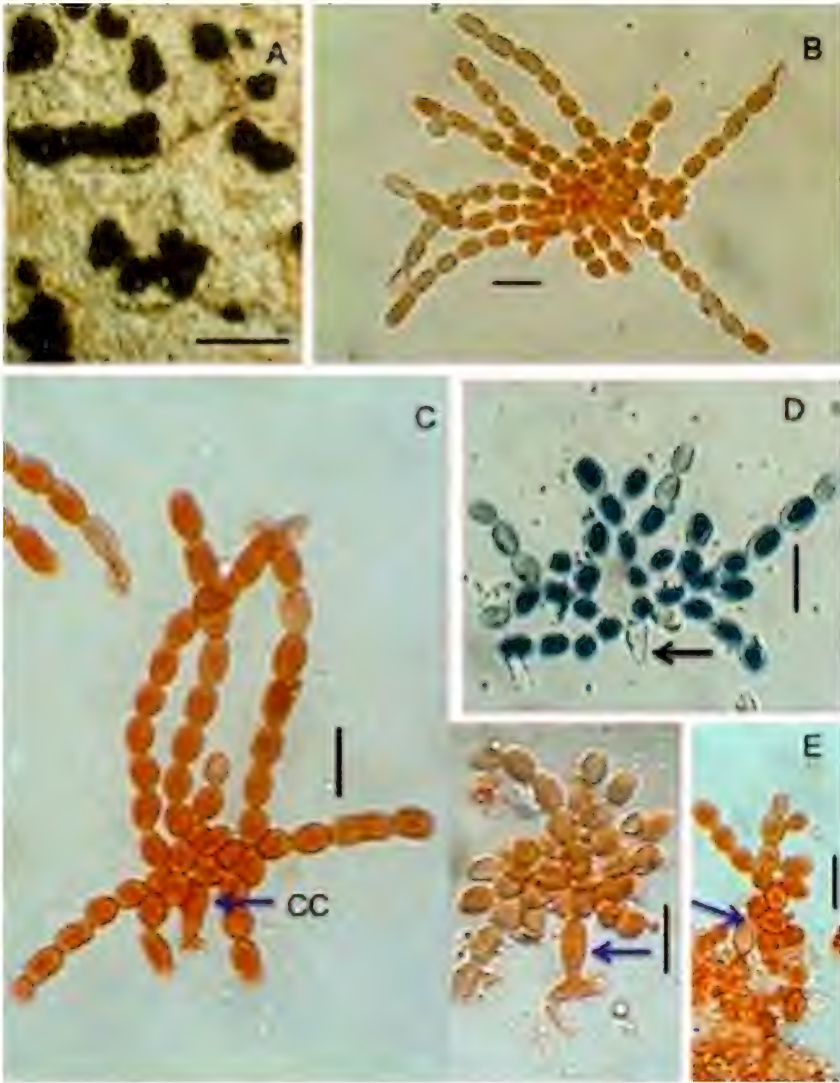


FIG. 1. *Brykendirckia catenata* (holotype, PAN 32735).

A. Sporodochia on natural substratum;

B–E. Conidia with conidiogenous cell (arrows showing basal cell).

Scale bars: A = 1000 μ m; B–E = 10 μ m.

cheiroid, blastocatenate, composed of branches with doliiform to oblong, botuliform, globose or subglobose, hyaline or subhyaline, smooth cells.

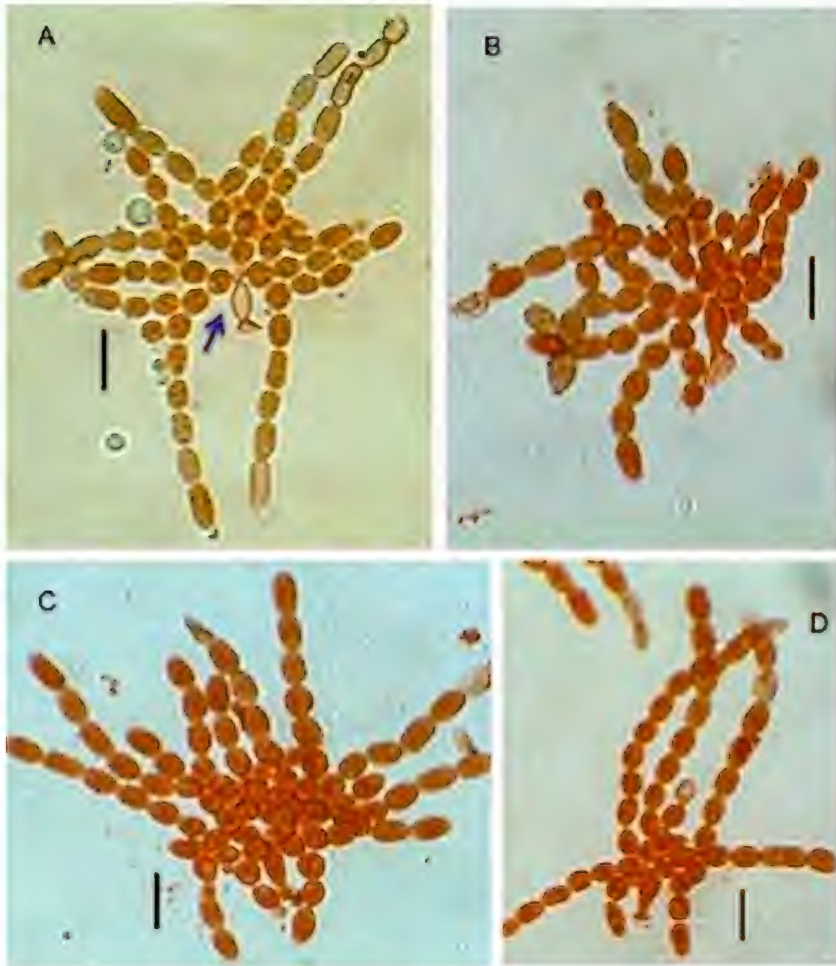


FIG. 2. *Brykendirckia catenata* (holotype, PAN 32735).
Conidia with conidiogenous cell (arrow).
Scale bars = 10 μ m.

Brykendirckia catenata Rajn.K. Verma, Prasher, Rajeshk., Sushma,
A.K. Gautam & R.F. Castañeda,
MB 835297

FIGS 1–4

Differs from *Brachyconidiellopsis* and *Brachyconidiella* species by its rudimentary, pustulate conidiomata and its undifferentiated conidiophores, which are reduced to discrete or integrated conidiogenous cells.

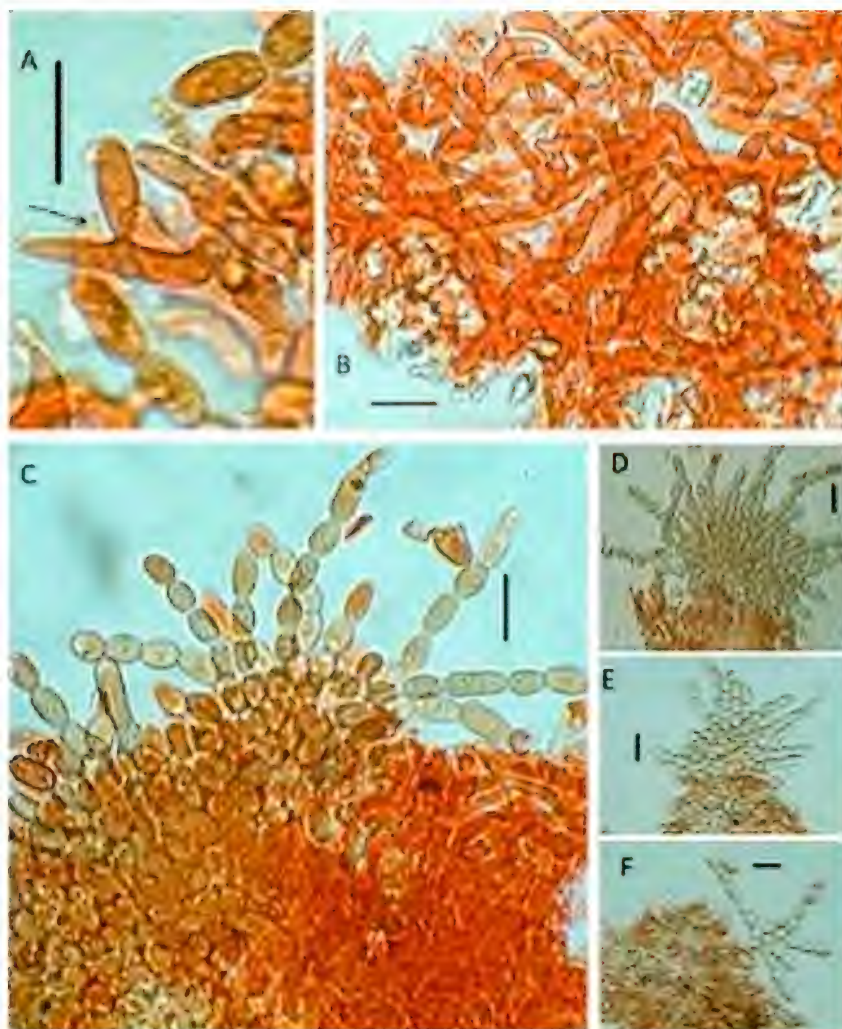


FIG. 3. *Brykendrickia catenata* (holotype, PAN 32735).

A. Conidiogenous cell arising from hyphae (arrow showing point of attachment);
B. Intermixed mycelium; C–F. Conidia attached to conidiogenous cell and mycelium.

Scale bars = 10 µm.

TYPE—India. Himachal Pradesh: Mandi district, 31°42'N 76°56'E, 800 m, from dead and fallen culms of a *Bambusa* sp., 22 July 2015, R.K. Verma (PAN 32735).

ETYMOLOGY—Latin, *catenata*, referring to the catenate conidia.

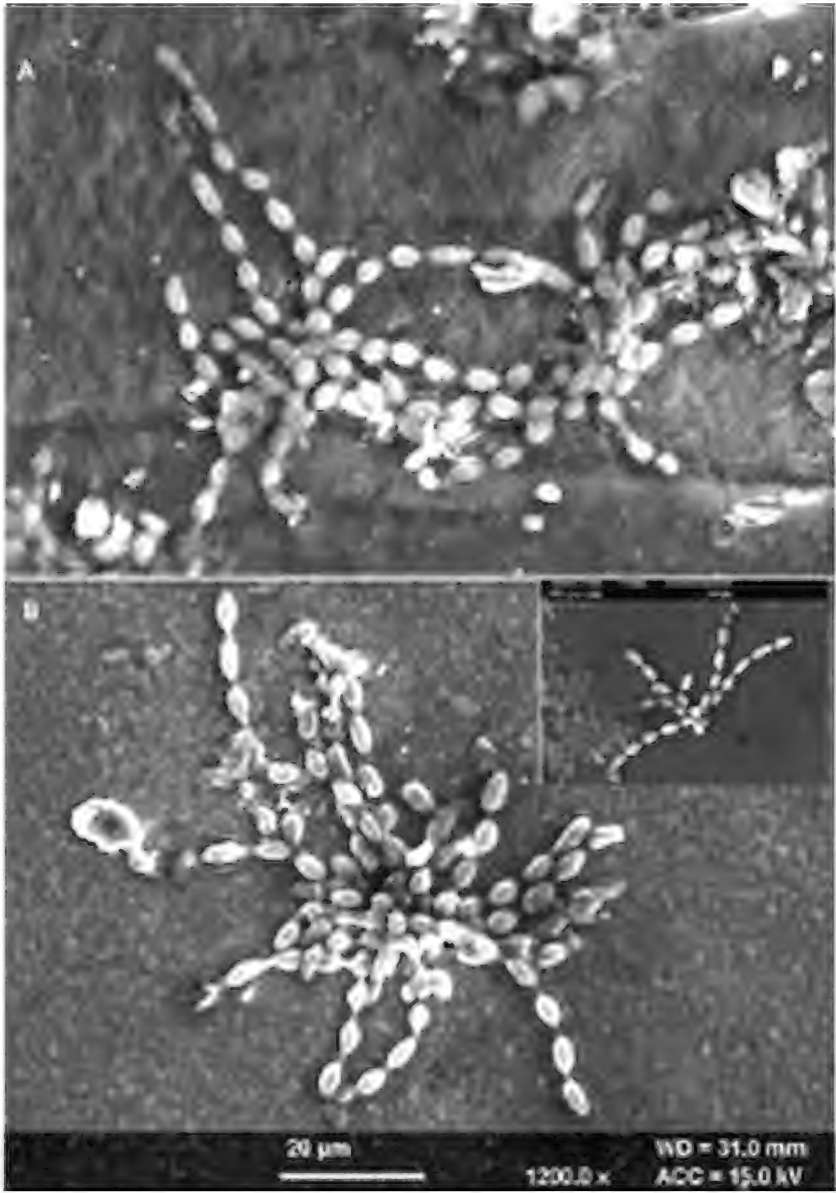


FIG. 4. *Brykendrickia catenata* (holotype, PAN 32735).
Conidia (SEM).

CONIDIOMATA on natural substratum sporodochial, rudimentary pustulate, irregular, blackish with smooth to slightly wavy margins, ≤ 1.8 mm diam. Mycelium mostly superficial, composed of hyaline to subhyaline, septate, rarely branched, smooth hyphae, $2.6\text{--}3.2\text{ }\mu\text{m}$. CONIDIOPHORES undifferentiated, reduced to conidiogenous cells. CONIDIOGENOUS CELLS polyblastic, discrete or integrated, rarely monoblastic, cylindrical to clavate, hyaline, $7.8\text{--}10.6 \times 3.2\text{--}4.5\text{ }\mu\text{m}$. Conidial secession schizolytic. CONIDIA loosely cheiroid, blastocatenate, branched, sub-hyaline to light grey in colour, $27\text{--}74.2\text{ }\mu\text{m}$ long, composed of branches with $5\text{--}13(20)$, doliiform, oblong, botuliform, globose or subglobose, symmetrical, hyaline, subhyaline to light grey cells, $4\text{--}8.7 \times 3.2\text{--}4.8\text{ }\mu\text{m}$.

Discussion

Conidial shape and pigmentation in *Brykendirckia* are morphologically reminiscent of several genera, including *Arbusculina* Marvanová & Descals, *Brachyconidiella* R.F. Castañeda & W.B. Kendr., *Brachyconidiellopsis* Decock & al., *Cladoconidium* Bandoni & Tubaki, *Matsushimaea* Subram., *Miricatena* Punith. & Spooner, *Speiropsis* Tubaki, and *Volucrispora* Haskins. *Brykendirckia* differs from *Arbusculina*, *Cladoconidium*, and *Volucrispora* in having a markedly different (terrestrial) ecology contrasting with the truly

TABLE 1. Comparison of *Brykendirckia* with similar genera

GENUS	CONIDIOMATA	CONIDIOGENESIS / CONIDIA	REFERENCE
<i>Brykendirckia</i>	Pustulate to sporodochial rudimentary	Polyblastic (rarely monoblastic)/ loosely cheiroid, blastocatenate, branched, branches with doliiform to oblong, botuliform, globose or subglobose cheiroid, sub-hyaline to light grey cells	Present study
<i>Miricatena</i>	None	Polyblastic/ hyaline, erect, solitary, solitary, complex, composed of almost symmetrical primary & secondary (rarely tertiary) chains	Punithalingam & Spooner 2011
<i>Brachyconidiellopsis</i>	Sporodochial or synnematal	Mono- to polyblastic/ cheiroid, penicilliform, repeatedly branched, branches moniliform, dry, remaining entire at maturity	Decock & al. 2004
<i>Brachyconidiella</i>	Sporodochial or synnematal	Monoblastic/ cheiroid, greyish brown to grayish black, repeatedly branched	Castañeda-Ruiz & Kendrick 1990b

aquatic habitat of the other three “Ingoldian” hyphomycetes (Seifert & al. 2011). In *Speiropsis*, conidiophores are macronematous and multiseptate, conidiogenous cells are polyblastic, and conidia are connected by a narrow cellular isthmus (Seifert & al. 2011). *Matsushimaea* lacks conidiomata, and the conidiogenous cells are monoblastic (Seifert & al. 2011). *Miricatena* (TABLE 1) lacks sporodochial conidiomata, and the primary conidial chains arise from the conidiogenous cells of the (semi-)macronematous 1–7-septate conidiophores, which further produce secondary (rarely tertiary) hyaline conidial chains (Punithalingam & Spooner 2011). *Brykendrickia* differs from *Brachyconidiella* and *Brachyconidiellopsis* in conidial development and conidiomata (Castañeda-Ruiz & Kendrick 1990b, Decock & al. 2004), which is postulate to rudimentary sporodochial in *Brykendrickia* versus sporodochial or synnematus with differentiated conidiophores in *Brachyconidiella* and *Brachyconidiellopsis* (TABLE 1).

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